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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/703,545	11/01/2000	Jesus Vela Estrada	NOVA 9217	1971

7590
Kenneth H Johnson
Patent Attorney
P O Box 630708
Houston, TX 77263

08/26/2003

EXAMINER

CHOI, LING SIU

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 08/26/2003

2

Please find below and/or attached an Office communication concerning this application or proceeding.

As2

Office Action Summary

Application No.
09/703,545

Applicant(s)
Estrada et al.

Examiner
Ling-Siu Choi

Art Unit
1713



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 2 6) ☐ Other:

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DETAILED ACTION

1. Claims 1-22 are now pending, wherein claims 1-21 are drawn to a process to prepare a catalyst for olefin polymerization and claim 22 is drawn to a process for solution polymerization.

Claim Objections

2. Claim 1 is objected to because of the following informalities: (a) claim 1, line 4, "where in" is suggested to be changed to --wherein--; (b) claim 1, lines 16-17, "from 0.5 **and in less than 20 seconds bringing temperature of the resulting mixture to from 120°C to 180°C by any of : 1** to 1.5:1; and a molar ratio of Mg : Ti from 3:1 to 8:1;" is suggested to be changed to --from 0.5 : 1 to 1.5:1; and a molar ratio of Mg : Ti from 3:1 to 8:1; and in less than 20 seconds bringing temperature of the resulting mixture from 120°C to 180°C by any of : --; (c) claim 1, line 19, "heating one **or more** of the mixture of step (ii) and the solution of the titanium compound or both" is suggested to be changed to -- heating one of the mixture of component (ii) and the solution of the titanium compound or both--; (d) claim 1, lines 22-23, "**mixing** the mixture of step (ii) and the solution of the titanium compound or both **either or both of said solutions may optionally be heated**" is suggested to be changed to --heating one of the mixture of step (ii) and the solution of the titanium compound or both--

Appropriate correction is required.

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Claim Rejections

3. **The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:**

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:**

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim Rejections - 35 USC § 102/103

5. Claim 22 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Zboril et al. (US 5,589,555).

Zboril et al. disclose a process for the solution polymerization of high molecular weight polymers of α -olefins selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and C_{3-12} α -olefin at a temperature from 105° to 320°C in the presence of a **catalyst** comprising a catalyst rsor and a catalyst activator, the catalyst precursor being

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prepared by the in-line mixing at a temperature of less than 30°C of a mixture consisting of (a) MgR^1_2 and AlR^2_3 , (b) a reactive halide which can be tert butylchloride, and (c) titanium tetrachloride, wherein $\text{X} / \text{Mg} = 2.2\text{-}2.4$; $\text{Mg} / \text{Ti} = 5$; $\text{Al} / \text{Ti} = 0.9$; $\text{Mg} / \text{Al} = 5.6$ and the catalyst activator being prepared by in-line mixing at a temperature of less than 30°C a composition consisting of AlR_3 and R^4OH , the contact of AlR_3 and R^4OH resulting in the formation of alkoxydialkyl aluminum (col. 6, line 21; col. 7, lines 5-8; claim 1). It is noted that the process to prepare the the catalyst is different from one claimed in the present invention. However, the catalyst made should be the same as one claimed in the present invention because they both contain the same composition. Thus, the present claim is anticipated by the disclosure of Zboril et al..

Claim Rejections - 35 USC § 103

6. Claims 1-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zboril et al. (US 5,589,555)..

The present invention relates to a process to prepare a catalyst for olefin polymerization, the process comprising **sequentially mixing** of

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mixing	(i) a mixture of $(R^1)_2Mg + Al^1(R^2)_3$
	(ii) a solution of HCl or R^3Cl
maintaining the mixture at a temperature from 25°C to 80°C for 5 seconds to 1 minute	
rapidly adding	(iii) a solution of $(R^4)_aTiCl_{b-a}$ a and b = 0 or intergers from 1 to 4 and $a + b = 4$
resulting mixture: $Mg / Al^1 = 3-8$; $Cl / Mg = 1.5-2.5$; $Al^1 / Ti = 0.5-1.5$; $Mg / Ti = 3-8$;	
bringing the resulting mixture from 120°C to 180°C in less than 20 seconds by (a) heating one of the mixture of part (ii) and the solution of the titanium compound or both to a temperature sufficient so that upon mixing the temperature is obtained within 20 seconds (b) heating one of the mixture of part (ii) and the solution of the titanium compound or both to a temperature insufficient so that upon mixing the temperature is not obtained and heating the resulting mixture at a rate to obtain the temperature within 20 seconds	
mixing the resulting hot mixture with	(iv) $(R^5)_2Al^2(R^6)$

(summary of claim 1)

Zboril et al. disclose a process to prepare a catalyst for olefin polymerization, wherein the catalyst comprises a catalyst precursor and a catalyst activator, the catalyst precursor being prepared by the in-line mixing at a temperature of less than 30°C of a mixture consisting of (a) MgR^1_2 and AlR^2_3 , (b) a reactive halide which can be tert butylchloride, and (c) titanium tetrachloride, wherein $X / Mg = 2.2-2.4$; $Mg / Ti = 5$; $Al / Ti = 0.9$; $Mg / Al = 5.6$ and the catalyst activator being prepared by in-line mixing at a temperature of less than 30°C a composition consisting of AlR_3 and R^4OH (col. 6, line 21; claim 1). Zboril et al. further disclose that the contact of AlR_3 and R^4OH results in the formation of alkoxydialkyl aluminum (col. 7, lines 5-8).

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The difference between the present claims and the disclosure of Zboril et al. is the requirement of the specific temperature and the specific contact order in the present invention.

With respect to the specific temperature, attention is drawn to Example 1, wherein "the catalyst was prepared by the in-line mixing **at ambient temperature** (approximately 30°C) of solutions of each of dibutyl magnesium, triethyl aluminum, tert butylchloride and titanium tetrachloride in cyclohexane, followed by the addition of further solution of triethyl aluminum in cyclohexane...tert butyl alcohol was added to the second aliquot of triethyl aluminum(thus forming the alkoxide)" (col. 6, lines 19-40). Furthermore, "the results show that, **at high temperature**, increasing the proportion of the alkoxydialkyl aluminum relative to the trialkyl aluminum **increases the activity of the catalyst**" (col. 7, lines 33-35). A conclusion can be drawn that the activity of the catalyst can be enhanced by increasing temperature at higher proportion of the alkoxydialkyl aluminum relative to the trialkyl aluminum.

With respect to the specific contact order, the case law held that "selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results." *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946). And, the case law also held that "selection of any order of mixing ingredients is *prima facie* obvious." *In re Gibson*, 39 F.2d 975, 5 USPQ 230 (CCPA 1930).

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the disclosure of Zboril et al. and thereby obtain the present invention.

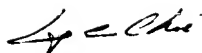
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Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is (703)305-0887.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reach on (703)308-2450.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the group receptionist whose telephone number is (703)308-2351.



Ling -Siu Choi

August 25, 2003